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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/627,677	07/28/2003	Naoki Imachi	SNY-036	4594

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EXAMINER

YUAN, DAH WEI D

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 06/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/627,677

Applicant(s)

IMACHI ET AL.

Examiner

Dah-Wei D. Yuan

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _____ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on _____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 28 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 07282003.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

NONAQUEOUS ELECTROLYTE BATTERY

Examiner: Yuan

S.N. 10/627,677

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June 6, 2006

Specification

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-6, 11-13, 15, 16 are rejected under 35 U.S.C. 102(e) as being anticipated by Gao et al. (US 2002/0119373 A1).

With respect to claims 1, 3-6, Gao et al. teach a non-aqueous lithium secondary battery, wherein the host material in the anode includes one or more materials capable of absorbing and desorbing lithium, such as $\text{Li}_4\text{Ti}_5\text{O}_{12}$ (subsidiary active material). In addition, Gao et al. teach the use of copper foil as the anode current collector. See Abstract, Paragraphs 20, 23.

With respect to claim 2, Gao et al. teach the host material further comprises carbon black. See Paragraph 20. Gao et al. do not specifically disclose the subsidiary active material has an electrical potential that is higher an electrical potential at which the carbon occludes and releases

lithium and is lower than an electrical potential at which copper is dissolved. However, it is the position of the examiner that such properties are inherent, given that both Gao et al. and the present application utilize the same anode active material. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999).

With respect to claims 11,12, Gao et al. teach the adhering of lithium metal (26) onto the anode of the battery. See Paragraph 18.

With respect to claim 13, Gao et al. do not specifically disclose the range of ratio of initial negative electrode charge capacity/positive electrode capacity. However, it is the position of the examiner that such properties are inherent, given that both Gao et al. and the present application utilize the same anode active material and cathode active material. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999).

With respect to claims 15,16, Gao et al. teach the use of LiCoO_2 as the cathode active material. See Paragraph 16.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are

such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Gao et al. (US 2002/0119373 A1) in view of Singhal et al. (US 6,827,921 B1).

Gao et al. disclose a non-aqueous electrolyte battery as described in Paragraph 3 above. However, Gao et al. do not specifically disclose the particle size of the $\text{Li}_4\text{Ti}_5\text{O}_{12}$ material. Singhal et al. teach the use of ultra fine powder of $\text{Li}_4\text{Ti}_5\text{O}_{12}$ with particles in the size range of 25-500 nm in the anode in order to improve the electrochemical performance of the battery. See Abstract, Column 1, Lines 11-19. Therefore, it would have been obvious to one of ordinary skill in the art to incorporate the $\text{Li}_4\text{Ti}_5\text{O}_{12}$ powder that is less than 5 μm in size in the battery of Gao et al., because Singhal et al. teach the use of fine anode powder to improve the electrochemical performance of the battery.

6. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Gao et al. (US 2002/0119373 A1) as applied to claims 1-6, 11-13, 15, 16 above.

The disclosure of Gao et al. differs from Applicant's claims in that Gao et al. do not specifically describe the amount of subsidiary active material in the anode. However, it is well known in the battery art that the charge/discharge capacity of the battery is determined by the amount of the anode active material, including subsidiary active material, in the battery. Therefore, it would have been within the skill of the ordinary artisan to adjust the amount of the subsidiary active material in the anode to yield desired electrochemical performance. *Discovery*

of optimum value of result effective variable in known process is ordinarily within skill of art. In re Boesch, CCPA 1980, 617 F.2d 272, 205 USPQ215.

7. Claims 1-6,13,15,16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koshiba et al. (US 5,545,468) in view of Gao et al. (US 2002/0119373 A1).

With respect to claims 1,3-6, Koshiba et al. teach a non-aqueous lithium secondary battery, wherein the anode includes $\text{Li}_x\text{Ti}_y\text{O}_4$ (subsidiary active material) wherein $0.8 \leq x \leq 1.4$ and $1.6 \leq Y \leq 2.2$. See Column 4, Lines 21-67. However, Koshiba et al. do not disclose the use of copper as the current collector. Gao et al. teach a non-aqueous lithium secondary battery, wherein the anode current collector is made of copper foil to transmit electrons to an external circuit. See Paragraph 23. Therefore, it would have been obvious to one of ordinary skill in the art to use copper as the anode current collector in the battery of Koshiba, because Gao teach the use of copper current collector to transmit electron to an external circuit.

With respect to claim 2, Koshiba et al. teach the host material further comprises carbon black. See Column 7, Lines 39-49. Koshiba et al. do not specifically disclose the subsidiary active material has an electrical potential that is higher an electrical potential at which the carbon occludes and releases lithium and is lower than an electrical potential at which copper is dissolved. However, it is the position of the examiner that such properties are inherent, given that both Koshiba et al. and the present application utilize the same anode active material. A reference which is silent about a claimed invention's features is inherently anticipatory if the

missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999).

With respect to claim 13, Gao et al. do not specifically disclose the range of ratio of initial negative electrode charge capacity/positive electrode capacity. However, it is the position of the examiner that such properties are inherent, given that both Koshiba et al. and the present application utilize the same anode active material and cathode active material. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature *is necessarily present in that which is described in the reference*. In re Robertson, 49 USPQ2d 1949 (1999).

With respect to claims 15,16, Koshiba et al. teach the use of LiCoO_2 as the cathode active material. See Column 3, Lines 35-47.

8. Claims 7-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Koshiba et al. (US 5,545,468) and Gao et al. (US 2002/0119373 A1) as applied to claims 1-6,13,15,16 above, and further in view of Singhal et al. (US 6,827,921 B1).

Koshiba and Gao et al. disclose a non-aqueous electrolyte battery as described in Paragraph 7 above. However, Koshiba and Gao et al. do not specifically disclose the particle size of the $\text{Li}_4\text{Ti}_5\text{O}_{12}$ material. Singhal et al. teach the use of ultra fine powder of $\text{Li}_4\text{Ti}_5\text{O}_{12}$ with particles in the size range of 25-500 nm in the anode in order to improve the electrochemical performance of the battery. See Abstract, Column 1, Lines 11-19. Therefore, it would have been obvious to one of ordinary skill in the art to incorporate the $\text{Li}_4\text{Ti}_5\text{O}_{12}$ powder that is less

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than 5 μm in size in the battery of Koshiba and Gao et al., because a Singhal et al. teach the use of fine anode powder to improve the electrochemical performance of the battery.

9. Claim 14 is rejected under 35 U.S.C. 103(a) as being unpatentable over Koshiba et al. (US 5,545,468) and Gao et al. (US 2002/0119373 A1) as applied to claims 1-6,13,15,16 above.

The disclosure of Koshiba and Gao et al. differs from Applicant's claims in that Koshiba and Gao et al. do not specifically describe the amount of subsidiary active material in the anode. However, it is well known in the battery art that the charge/discharge capacity of the battery is determined by the amount of the anode active material, including subsidiary active material, in the battery. Therefore, it would have been within the skill of the ordinary artisan to adjust the amount of the subsidiary active material in the anode to yield desired electrochemical performance. *Discovery of optimum value of result effective variable in known process is ordinarily within skill of art.* In re Boesch, CCPA 1980, 617 F.2d 272, 205 USPQ215.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dah-Wei D. Yuan whose telephone number is (571) 272-1295. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dah-Wei D. Yuan
June 6, 2006



DAH-WEI YUAN
PRIMARY EXAMINER